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BULLETIN

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Notes on New England Marine Algae.—VI.

By Frank S. Collins.

The species mentioned in the following notes have not, as far as I know, been recorded from our coast, except that *Ralfsia pusilla* and *Desmotrichum undulatum* were mentioned in the Flora of Mount Desert by Rand & Redfield, and *Entophysalis granulosa* in my list of the algae of Atlantic City, N. J., Bulletin, December 1888. Unless otherwise noted, the specimens were collected by me.

Entophysalis granulosa Kütz. This species I have found at Cape Rosier, Maine; Mr. Isaac Holden finds it at Stratford, Conn.; and it occurs at Atlantic City, N. J.; probably it is common all along the coast. It forms a crumbly incrustation at high-water mark, and seems to prefer lagoons or high tide-pools, where the water is quite salt and where the level does not vary much. It is figured and described in Bornet & Thuret, Notes Algologiques, 1. *pl. 1. fig. 4 and 5*, and distributed in Collins, Holden & Setchell, Phyc. Bor. Am. no. 152.

Spirulina Meneghiniana Zan. Found in August, 1893, in the salt marshes at Revere, Mass., in scattered filaments among other algae in a ditch of brackish water. It has a much looser spiral than *S. subsalsa* Oersted (*S. tenuissima* of Farlow's Manual). Figured and described in Gomont, Monogr. des Oscill., 270. *pl. 7. fig. 28.*

Hydrocoleum lyngbyaceum rupestre Kütz; Gomont, Monogr. des Oscill. 76. *pl. 12. f. 8–10.* This species was abundant at Goose Creek, Cape Rosier, Maine, in July of 1893 and of 1895, forming a rather thick, black, slimy coating on dead sticks Zostera, etc.

AMPHITHRIX JANTHINA (Mont.) Bornet & Flahault. This occurs at Rockport, Mass., on wet cliffs just above high water mark; and var. TORULOSA (Grun.) B. & F. grows in abundance in the autumn months on stones in a ditch in the salt marshes at Revere, Mass. Though described by Bornet and Flahault as a fresh-water plant, at this last station it grows in company with brackish and marine species like *Polysiphonia subtilissima* and *Ectocarpus confervoides*.

EPICLADIA FLUSTRAE Reinke, Atlas Deutscher Meeresalgen, 31. *pl. 24.* Appears to be common along the coast on Sertularia, Flustra, etc., the densely packed branching filaments forming a thin green coating on the host. Distributed in Phyc. Bor. Am., No. 160.

In Farlow's Manual of the Marine Algae of New England, Le Jolis is followed in including the species of *Enteromorpha* in the genus *Ulva*, and considering most of our forms as subspecies or varieties. Subsequent study by Agardh, Ahlner, Reinbold and others has tended to considerably change this arrangement, and it is now generally recognized that *Enteromorpha* should be considered as a distinct genus, represented by quite a number of species in this region. *E. compressa* (L.) Grev., *E. intestinalis* Link, *E. clathrata* (Roth) J. Ag., *E. Hopkirkii* Harv. and *E. ramulosa* (Engl. Bot.) Hook., which appear as synonyms in the manual, are now accepted as specific names, as is also *E. marginata* J. Ag., which was recorded in the BULLETIN for December, 1884, under the name of *Ulva marginata*. *E. micrococca* Kütz was mentioned by the writer in the BULLETIN for November, 1891, and *E. erecta* in J. Agardh, Till Alg. Syst. 3: 152.

To these can now be added the following:

E. PROLIFERA (Fl. Dan.) J. Ag., a species resembling in habit *E. compressa*, from which it is distinguished by having the cells arranged in longitudinal series almost throughout. It appears to be common all along the coast.

E. CRINITA (Roth) J. Ag. This species resembles *E. clathrata* in ramification, but the cells are not arranged in a netlike manner, resembling rather those of *E. compressa*, from which it is distinguished by the uniform arrangement of the cells in longitudinal series. The ramuli often terminate in a single row of cells, which is, however, much shorter and less characteristic than in *E. Hopkirkii.* It appears to be not uncommon.

E. TORTA (Mert.) Reinbold. In this species the fronds are very slender, from two to eight cells in breadth, the cells always in longitudinal series and usually in cross rows; the branches are only one or two cells broad, resembling the filaments of *Tetranema percursum*, but without the exactly symmetrical arrangement of cells in the latter. I found it at Eagle Island, Penobscot Bay, Maine, in July, 1894, growing in company with other *Enteromorphas*, *Cladophora expansa*, *Lyngbya aestuarii*, etc., in a lagoon reached by only the highest tide, and the water of which often became by continued evaporation, salter than the ocean.

At this same locality I found, in July 1893, a plant in regard to which I have been in some doubt, but I venture to describe it as

E. CRUCIATA n. sp.

Fronds branching, mostly of a single series of cells, but at the point of branching of two series or sometimes more; branches issuing at right angles or nearly so, usually opposite, but sometimes alternate or secund, simple, usually short, tapering; monosiphonous filaments usually 20–30 μ. diam.; cells about as long as broad, cell wall very thick; in the irregular cellular masses where several branches issue near together, the cells are rounded, up to 50 μ diam.

The general appearance of the fronds is somewhat like that of *Rhizoclonium*, and the shorter branches somewhat resemble those of the latter genus; but the branches are much more numerous and longer; they are mostly opposite, but sometimes issue two or three on the same side of the main filiment. Younger parts bright green, older nearly colorless. Found unattached, among floating masses of *Cladophora*, *Enteromorpha* and *Lyngbya* in warm shallow water of lagoon, Eagle Island, Maine, July, 1893.

STREBLONEMA FASCICULATUM Thuret. *S. volubilis* Pringsheim, Beiträge zur Morphologie der Meeresalgen, *pl. III.*, *B.* Growing in the fronds of *Castagnea virescens*, Spectacle Island, Penobscot

Bay, Maine. Distinguished by the relatively large, branching plurilocular sporangia.

ECTOCARPUS AECIDIOIDES Rosenvinge, Gronlands Havalger, 894. *fig. 27*. A minute species, forming spots barely visible to naked eye, on old fronds of *Laminaria* species. The vegetative filaments grow in the interior of the frond of the host plant; when fruiting, the sori are formed directly under the epidermis, which is pushed upward and finally ruptured. Found at York Island, near Isle au Haut, Maine, July, 1894.

DESMOTRICHUM UNDULATUM (J. Ag.) Reinke, Atlas, 15. *pl. 11.* Resembles a small *Punctaria*, and grows commonly on *Zostera marina* in quiet bays. The *Punctaria latifolia* var. *Zosterae*, ot Farlow's Manual, is probably in part identical with this species. I have found it on the coasts of Maine and Massachusetts, and Mr. Holden finds it at Bridgeport, Conn. Specimens from the latter locality are distributed in Phyc. Bor. Am. no. 129. In company with this species we generally find more or less of the following:

D. BALTICUM Kütz. A much slenderer species, mostly of a single series of cells, ending in a long, colorless hair. See Reinke, Atlas, 15. *pl. 12.* The limits of species are very difficult to define in this and the related genera, and it would not be difficult to arrange an uninterrupted series of specimens from the fine, Ectocarpus-like *D. scopulorum* to the coarse, leathery *Punctaria plantaginea.*

RALFSIA PUSILLA (Strömf.) Holmes & Batters (*Stragularia pusilla* Strömfelt, Notarisia, 3: 382. *pl. 3. f. 4.* 1888). The smallest species of the genus and of quite different habitat from the others, which grow on rocks and woodwork, while this is epiphytic. The original description gives it as occurring on *Laminaria;* on the New England coast I have found it from Marblehead to Mount Desert, growing on *Chaetomorpha aerea* and *C. Melagonium*, forming thin, black "collars" around one or more cells in the upper part of a filament.

SCYTOSIPHON LOMENTARIUS COMPLANATUS Rosenvinge, Gronl. Hav. 863.

This variety, described from Greenland specimens, has been found by Mr. Holden growing abundantly and luxuriantly at Bridgeport, Conn. It is a spring plant, disappearing in early summer; it differs from the type by the flattened, not constricted frond, and by the lack of paraphyses when in fruit. Distributed in Phyc. Bor. Am. no. 173.

FUCUS ARESCHOUGII Kjellman, Handbok i Skandinaviens Hafsalgflora, 1 : 11.

A northern form, growing on exposed rocky shores near high-water mark. It resembles some forms of *F. vesiculosus* that grow in similar localities, but is distinguished by the hermaphrodite conceptacles. The narrow, closely and regularly forked fronds with the ultimate segments at nearly uniform height, and ending in small spherical or ovate receptacles, distinguish it from *F edentatus* and *F. evanescens*, both of which, moreover, grow near low-water mark. It approaches nearer to *F. platycarpus*, and the receptacles are often margined as in the latter; there may be intermediate forms, but the types seem distinct, *F. platycarpus* being a larger plant with broader frond, and having the fruiting segments lateral. *F. Areschougii* occurs from Marblehead northward, and is very common on the coast of Maine.

CHANTRANSIA CORYMBIFERA Thuret.

This interesting species, the only one of the genus in which occurs a true sexual reproduction by means of antheridia, trichogynes and carpospores, was collected for the first time in America by Mr. George Waterman, in August 1893, at Marblehead, Mass. It has since been found at Wood's Hole, Mass., by Mr. C. P. Nott, and specimens from the latter locality are distributed in Phyc. Bor. Am. no. 192. In both localities it grew on *Ceramium rubrum* and *Cystoclonium purpurascens*. Figured and described in Bornet & Thuret, Notes Algologiques, 16. *pl. 5*.

PEYSSONELLIA ROSENVINGII Schmitz, in Rosenvinge, Gronl. Hav. 782. *f. 8*. A specimen which I found at Spectacle Island, July, 1894, is identified by Rosenvinge with this species. It grew on a mussel shell, and I have found the same species on several occasions growing on the shells of live crabs. In every case it grew, not directly on the crab or mussel shell, but on a *Lithothamnion*, which Rosenvinge identifies with *L. circumscriptum* Strömf. Whether the *P. Dubvi* of Farlow's Manual is the same as this, or whether we have two species, I cannot say; as far as I know there have been only sterile plants observed here, probably because the plants fruit in winter.

HALOSACCION SCOPULA Strömfelt, Meeresalgen Islands, 173; Om Algvegetationen vid. Islands Kuster, 29. *pl. 1, f. 16; pl. 2. f. 1.* A form agreeing very well with Strömfelt's description and figure was found by me at York Island, Maine, July, 1894. In view of the great range of variation in *Halosaccion ramentaceum*, it is doubtful if this can be given higher rank than that of a variety.

In my notes on N. E. Marine Algae, V., in the BULLETIN for November, 1891, I mentioned *Calothrix Contarenii* as found at Revere Beach, Mass. Dr. Bornet informs me that the specimens from this locality were wrongly determined, and are nearer to *C. fasciculata*, the difference from the type of the latter being chiefly a matter of dimensions.

Nitella subspicata sp. nov.

BY T. F. ALLEN.

(PLATE 253.)

Nitella monarthrodactyla, furcata, homoeophylla, monoica, gymnocarpa, acuminata.

Plants from fifteen to twenty centimetres high, diffusely branched; leaves acuminate, those of sterile verticils, spreading, diffuse, of the fertile verticils contracted, forming somewhat dense heads (remotely spike-like). Fertile verticils arise from within the verticil of the sterile leaves on peduncles which are sometimes very short and sometimes elongated. The leaves are once divided; terminal segments (3 or 4) one-celled, long-acuminate, somewhat inflated at the middle. Antheridia 240 in diameter. Sporophydia one to three at a node of the leaf (usually two), 306 long from base to tip of coronula. Nucleus 225 long, 200 broad, with six prominent acute ridges, nearly black. Membrane of the spore quite smooth.

Measurements: stem diameter 780 to 830, leaf diameter 488, 500 to 610; terminals diam., 400, 464 and 490.

Collected in Missouri by J. W. Blankinship.

This plant is nearly related to *Nitella subglomerata* A. Br., from which it differs by its more contracted "heads;" its smaller antheridia and oöspores, as well as by the perfectly smooth